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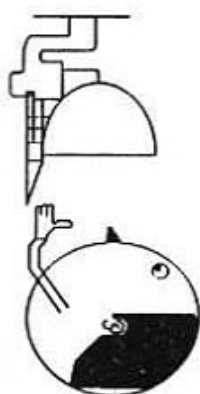
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NEWS ON 4

SPECTRUM KEYBOARD SHORTAGE SOLUTION AT HAND

As anyone who owns a Spectrum knows, replacement keyboard membranes are very hard to find these days - and a computer without a keyboard is just about useless.

Well the good news is that German company Sintech have announced a new interface called *PROFACE* which will allow the connection of any standard PC type keyboard to the Spectrum. Two versions will be available, one external (with through connector) and another which will fit inside the Spectrum.

The *PROFACE* was previewed at the German Spectrum show which took place recently in Sindelfingen (moved from the normal place of Filderstadt due to problems with the venue).

At the moment we have no prices for the *PROFACE* but anyone interested can write to Sintech, Gastäckerstr. 23, D-70794 Filderstadt, Germany.

SIM COUPÉ

If you have a PC with Internet access the latest release of the SAM Emulator, SimCoupé, written by Allan Skillman is now available for down-loading.

While still a development release of SimCoupé, the final version is still some way in the future, this latest version (v0.74) is now considered ready for a wider audience.

You can download the files from:
http://www.hep.ucl.ac.uk/~ajs/simcoupe/simcoupe_snapshot.html (all one line of course).

Many of you will have already seen SimCoupé running at one of the

Gloucester shows, most SAM software that does not use disc protection seems to run quite happily on it.

This version is the first to include Aley Keprt's SAA 1009 sound chip emulator. If your machine has a compatible sound card then SimCoupé will now produce six channel stereo sound.

As this is still a development version Allan can offer no guarantee as to how well it will perform on different systems but it is well worth the effort in down-loading. Allan will be glad of any feedback on bugs or problems you may find.

A general release version will probably be out in the new year on PC disc. We are talking to Allan about bundling a few demo programs with SimCoupé so PC owners who have never had a SAM will have something to show them how good the machine really is.

YOUR NEWS HERE...

Come on readers, we need your news. Anything related to computers which you think will interest other SAM and Spectrum owners. Just jot it down on a piece of paper, add your name and membership number, and send it off to us at the usual address. Please mark the envelope 'News' so that we can give it the priority it deserves.

Remember, you get three months extra subscription for every news item we print, so don't rely on others to send in an item you have seen - send it off yourself and earn our thanks as well.



The Editor Speaks

This last month has been one of the worst periods that I can remember. First, a close friend found that he had a growth in his head, called an *Acoustic Neuroma*, that needed very swift treatment. With a week to go to the Gloucester show I was running to and fro to Bristol's Frenchay hospital with his wife as he underwent a gruelling ten hour operation. Having first breathed sighs of relief that he came through the operation OK we then had to face the news that he needed another, even more delicate ten hour op to finish the job (now thankfully behind him as well).

This has meant that for most of the last six weeks or so I have not been available in the evenings to man the telephone hotline. I'm sorry if this has caused any inconvenience to anyone and hope that you will understand.

But then even worse news hit us. Just the day before the Gloucester show Jenny took a telephone call from John Wase, to say that his wife had collapsed at home. She was on life support in hospital but sadly was not expected to live. John and Lorri had been married less than four months, I still had pictures on my camera from the wedding in July which had not been developed, and here was John facing the loss of his second wife in less than three years. What can you say? What can you do in a situation like this?

We kept in contact as best we could, John of course was at the hospital all week-end so he was difficult to get hold

of. We told anyone who asked at the show, and however bad it seemed there was always hope. However, sadly, on the Tuesday, the life support was switched off. The following Monday my wife, Rose, and I attended the funeral in the Bishampton church John and Lorri had been married in.

John would like me to pass on his thanks to everyone who sent messages of sympathy and support - he appreciated very much your kind thoughts.

Of course, as you can well understand, there is no Short Spot this month. John will be back for the December issue and has asked me to make a special appeal for any small Christmassy snippets you could possibly rush him - *please!!!*

Moving on to nicer things now. The Gloucester show was another success, everyone seemed to enjoy themselves and with the good weather we had laid on for the day people came from far and wide. I think the highlight of the show had to be Colin Piggot's new SAM game on the Quazar stand - *Stratosphere*. I must admit that I spent quite some time sitting on the **FORMAT** stand looking across the hall at the game. If you are a SAM owner, and if you didn't get to Gloucester to see it, order it right away. See news item in Vol.11 N°1 for details.

So, at least we end on a happy note. Let me be the first to slip in a Merry Christmas (well the Easter eggs will be in Woolies next week...)

Until next month.

Bob Brenchley, Editor.

SAM elite 512

The advanced computer that retains a user friendly appeal which makes even the beginner feel right at home. An easy to learn Basic and disc operating system (no messing with slow tapes here) will allow you to do things you never thought possible before. Your SAM comes with a very easy to read manual and everything you need to get started - it even has some pretty impressive demo software for you to run, just to give you a few ideas for starters.

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Both types are available in either kit form or ready assembled. For the kit you will need screwdriver, soldering iron, solder and a reasonable level of soldering skills. All you need for the assembled version is a screwdriver. Full fitting instructions are given and the only other thing you need is a standard PC type disc drive from your local supplier (cost about £20 to £25).

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The HELP PAGE

Edited By:- Ray Bray.

It is some three months since we had the last Help Page but during that time we have been able to answer by post several queries from readers and can now combine some of these into this months issue.

The first item concerns Microdrives which haven't featured in these columns for several years. Mr Stafford-Baker who writes from Toppesfield in Essex has a mass of Tasword2 files stored on microdrive tapes which he would like to transfer to SAM discs. He would like to know if there is a more elegant way to do this other than to re-record them on Spectrum tapes and then transfer them to SAM via an emulator and then record them to SAM disc. His Spectrum is the 48K model.

I'm pleased to say there is a simpler way to complete this task which involves either the use of the tape routines on Spectrum and SAM to transfer the files via a small amplifier, or, if you have the SAM Communications Interface, by using the RS232 procedures to transfer the files via Interface 1 on the Spectrum. On balance, although the transfer speed is lower when using the tape routines, the software is simpler and it is much easier to see what is happening during transfer, but if you can get to grips with the RS232 link it could be useful for other purposes. We will concentrate on the tape method.

The amplifier I have used in the past is the control box which came with a small two-way intercom unit purchased from Tandy's some years ago, which they still

sell at £9.99. However, Tandy now sell an 'Amplifier-Speaker' under the *Radio Shack* brandname costing £7.99. This is more suitable than the intercom unit as it is already fitted with 3.5mm input and output sockets and therefore requires no modification. You will, however, have to manufacture a cross-over lead to connect it to the SAM, as the output of the amplifier is the reverse polarity of that needed by the tape input circuit.

So much for the equipment. Before attempting to transfer files, it is necessary to find the correct volume setting for the amplifier. To do this you need to transfer some code to the SAM and the easiest way is to move the first 100 bytes of the Spectrum ROM using the following procedure:-

- a. Connect the amplifier to the EAR socket on Spectrum and the TAPE socket on SAM. Switch on the Spectrum and SAM. Set the amplifier volume control to mid-position and switch on.
- b. Spectrum. First get a hard-copy of the first 100 bytes so you can check for correct transfer; i.e. enter and run this small routine:-

```
FOR N=1 TO 100:
LPRINT PEEK N;" ";:NEXT N.
```
- c. Having done this then enter SAVE "test" CODE 1,100 and you will see the usual message "Start tape, then press any key." Ignore this prompt for the moment.
- d. Now go to the SAM and enter DEVICE T: CLEAR 59999 and enter LOAD "filename" CODE 60000. At this stage nothing happens apart from the

border changing to white. Go back to the Spectrum and press any key and you should see the program start to load on SAM, indicated by the filename "test" appearing and the alternating colours in the borders of the SAM display.

- e. If the code fails to load properly, adjust the volume control and try again. With my set-up the volume could be set between 30% & 70%. Once the code has been transferred, check that it is correct by listing the bytes from 60000 to 60100 on the SAM and checking them against those on the Spectrum printout.

Now you are ready to transfer your files, but first a note of caution. It is best not to use MasterDOS on SAM because, if you have used either '/', '\', '?' or '*' in any filenames the transfer will fail, as these have reserved uses in MasterDOS. It is possible to transfer all code files to SAM discs without the need to use SPECMAKER but whether you do so or not depends upon the use you wish to make of them, but Tasword files do not require the use of SPECMAKER.

However, to transfer Basic program files and "DATA" files the emulator must be used. If you are transferring CODE files without the emulator remember to enter DEVICE T on SAM.

The following Basic loading and saving routines can be used to speed up the operation of transferring a series of Tasword files (or any code files) when not using SPECMAKER.

SPECTRUM

```
10 REM Set up filename array
20 CLEAR #:CLS #: CLEAR 31999
30 INPUT "Number of files?";Q
40 DIM N$(Q,10)
60 OPEN #4,"m";1;"ccat"
70 INPUT #4;C$
80 PRINT AT 0,10;C$
90 INPUT #4;F$
```

```
100 FOR J=1 TO Q
110 INPUT #4;F$
120 LET N$(J)=F$
130 NEXT J
140 CLOSE #4
150 REM Load & transfer files
160 FOR J=1 TO Q
170 CLS: LET F$=N$(J): PRINT F$
180 LOAD "*"m";1;F$
190 LET AD=32000
200 LET L=PEEK 23793+256*PEEK 2
    3794
210 SAVE F$ CODE AD,L
220 NEXT J
230 STOP
```

SAM

```
10 CLEAR 32700
20 DEVICE T
30 LOAD "*" CODE 32768
40 LET F$=MEM$(19281 TO 19290
    )
50 LET L=PEEK 19315 +256*(PEE
    K 19316)-32768
60 PRINT AT 10,5;"Saving ";F$
    ;" CODE"
70 DEVICE D1
80 SAVE F$ CODE 32768,L
90 CLS: GOTO 10
```

The SAM program has been checked but I am unable to check the whole of the Spectrum program without a Microdrive. In particular I am not sure about obtaining the file length 'L' from the addresses in line 200. An alternative source is from the address given in the Channel Descriptor:-

```
LET A=(PEEK 23582)+256*PEEK 2358
3 : LET B=(PEEK 23631)+256* PEEK
23632 : LET C=A+B-1 : LET L=PEEK
(C+69)+256* PEEK(C+70)
```

Although ideally a TV/monitor is required for each computer it is possible to operate with only one, provided it is connected to the Spectrum once the programs are loaded and the SAM routine initiated. The transfer is not entirely automatic as you are prompted to press any key to transfer the code to SAM. Run the SAM program first and it

will go into a hold waiting for the first file to be copied. Run the Spectrum program and it will load the first file then give the prompt to press a key after which the usual tape loading procedure taking place on SAM. The Spectrum program STOPS automatically when finished but you have to press the Escape key on SAM.

The above programs cannot be used when using SPECMAKER and the following procedure is required:-

- a. Place the SPECKMAKER disc in Drive 1 and enter **LOAD 2** then select Option 2 to load **Specmak1**.
- b. On the request "Specrom Version?" press key 2 and the Directory of the SPECMAKER disc is displayed.
- c. At the request "File Name?" simply press **RETURN** and you will see that the SAM is in the Spectrum mode.
- d. Load the Spectrum with the first Microdrive file you wish to transfer and enter **SAVE "filename"** plus any necessary supplementary details. On the SAM enter **LOAD "filename"** (plus supplementary details), and then press any key on the Spectrum to transfer the file.
- e. Save the file to **RAMDISC** using **SAVE "name"** etc. and, for peace of mind, do a **CAT** to see that it is on the Ramdisc. If you wish you can do a **NEW** before transferring the next file.
- f. Continue transferring files until the Ramdisc is full. The disc is only 120K on the 256K SAM but it is automatically expanded to over 360K on a 512K SAM. A total of 32 files are allowed.
- g. Once the Ramdisc is full, transfer the files to a SAM disc using the "Saving Ramdisc to SAM diskette" procedure.

The next question concerns a problem encountered in the installation of a DISCiPLE on a Spectrum +2. Mr

J.Woodhead of Hebden Bridge, Yorkshire, obtained a DISCiPLE with a disc containing two system files and four configuration files. When he entered **RUN** to load the system the drive was powered up but the system did not load. According to the notes he received with the disc, the only difference between the two system files is that one has a stepping rate of 6 and the other is 12. He also understands that they are configured for two disc drives and a printer, whereas he has only one drive and no printer.

Having had no success with the system disc, he transferred the configuration files to tape and tried to start from scratch and set up a new configuration file. However, when the program reached the point where the 'Congratulations' tune was played and he pressed a key to continue, the program stopped with the report "Invalid Code 60:20".

Mr Woodhead wondered whether the the system files and the installation tape he made were faulty and sent us a copy to check.

We have examined the files and the first thing which is clear is that the taped programs are not faulty. The program error report refers to the second command in Line 60 of the program which loads the **Config3_C** program. This is a short routine designed to transfer the disc operating system from the Spectrum RAM where it is first loaded, to the interface RAM from where it operates. Unfortunately the **Config** program you have on tape is the one for the **PLUS D** and not the **DISCiPLE**. When **MGT** designed the **PLUS D** they decided to place the RAM above the ROM in the **PLUS D**'s memory, whereas the **DISCiPLE** has the RAM below the ROM. The program is therefore attempting to load the system into the wrong area, hence the error message.

Although it would be possible to amend the PLUS D's Basic Config program to put the System in the right place, this would not be much use as the System itself is different in several respects. However if you have a version 3 DISCiPLE (I believe you can check this by entering RUN without the system disc in place), then **FORMAT** still has DISCiPLE configuration tapes for sale at about £3.95. If you don't have this version then the best thing would be to upgrade to UNIDOS from S.D.Software.

What is not clear is why you can't boot with the two system files you have on disc. It could be that these are just not suitable for your set-up which you say is different from the one used for the system disc, but I would have thought that the system code would have still loaded, or perhaps they were made on a different version of DISCiPLE (were there different versions?).

The other thought is that if the system disc was not created on the disc drive being used with the DISCiPLE, then the drive might require a slower stepping rate to read the disc. Sadly you are in a CATCH 22 situation here as it is not possible to modify the stepping rate until the system is booted as the command 'POKE @3,n' cannot be entered.

Finally, another cause of the problem might be that there is a fault in the DISCiPLE. As I do not have access to a DISCiPLE I am unable to check the system files for you. My advice would be to buy a DISCiPLE configuration tape and attempt to set up a new system from scratch. Even if your DISCiPLE has a fault, and you still are unable to get it to work, you won't have lost much.

Our next problem also concerns disc operations on the Spectrum +2.

Mr R.Webster writes from Stuart's Point in New South Wales Australia, to say that he managed to obtain a +2A to

replace his Spectrum+ which has expired and had also purchased a FIXIT kit from Brian Gaff to use his PLUS D with the +2A. Having installed the replacement IC and connected everything up he tried to set up the system disc using the MGT System Tape. In common with the previous reader, the installation got as far as the music and, on pressing a key to continue, either the screen went blank and the computer locked up, or the report '@ M 60:2. RANDOMIZE USR 40300: RANDOMIZE USR 49000' was displayed.

I'm sorry to hear that your Spectrum+ has expired Mr Webster after years of faithful service, but I'm sure you will grow to love the +2A once you get it working properly! From the description you have given there are four possible reasons for the problem:-

- a. You have used the wrong procedure to load the installation tape.
- b. The Z80 processor chip on your Spectrum is faulty.
- c. The chip you have installed was faulty or was damaged whilst fitting it.
- d. There is a poor connection between the FIXIT, the computer, and the PLUS D interface.
- e. The installation tape is faulty.

I suggest you look at item (a) first. You should not load the program directly from 48K or 128 Basic. The correct method for loading the configuration tape is as follows:-

- a. Switch on the computer and from the initial screen menu move the cursor bar to "128 BASIC" and press ENTER.
- b. Now press EDIT to bring up the Edit screen menu.
- c. Move the cursor bar to "SCREEN" and press ENTER.
- d. You are now ready to load the configuration tape and follow the on-screen instructions.

If this does not solve your problem then try cleaning the connections to the FIXIT and the PLUS D and ensure that the units are firmly plugged in and, if necessary, supported by some packing under the PLUS D case. From the description you have given it does not seem as though the main configuration tape is at fault although the Config3_C file, (which is the basis of the error report), might possibly be corrupted, but this is unlikely as it did load correctly.

The next most likely problem is a Z80 processor chip that is not generating the M1 signal. It is quite a common problem, although more so on older (Sinclair) Spectrums.

One final thought. I once heard of an instance where a PLUS D would not work correctly with a Spectrum +2A because the local mains voltage was well below the nominal 240 volts required by the power supply unit, although the 2A worked well without the PLUS D attached. I think the supply was at about 220 volts. The problem was solved by changing the power supply unit transformer to one which operated at 220 volts.

Now for a couple of 'Items Arising' from previous issues. Firstly in response to Peter Dean's wish to obtain TASWORD2 for SAM, Eric Day kindly sent me his copy which he no longer needed and I have forwarded this to Peter. Incidentally, the SAM TASWORD2 will read the files on PLUS D discs directly as the new address for the files is computed by the program. The second item is from Doug Casterton who was having problems with screen interference on a NOKIA TV when used with SAM. He says the problem has been completely cured by fitting a Switch Mode Power Supply which now drives the SAM, TV, 40MB Hard Drive and a printer, dispensing with the SAM PSU

completely (it has a 5V at 3 Amps and 12V at 2 Amps).

Finally, does anyone know of a utility to transfer files from Commodore tapes to Spectrum tapes?

That's all we have for this month. Please keep sending your problems/answers to the following addresses:-

Anything SAM or General Purpose:-

Ray Bray (**FORMAT** Help Page),
Spring Cottage, Bourne Close,
Porton, Salisbury, Wilts, SP4 0LL.

Anything +3, CP/M:-

Mike Atkins (**FORMAT** Help Page),
70, Rudgwick Drive,
Bury, Lancashire, BL8 1YE.

Please remember that if you want any discs/printouts etc returned then you must include an SAE, and you must also include an SAE if you need an answer in advance of the next Help Page.

FORMAT

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THE MILLENNIUM FILES

By:- Jenny Bundock.

Here we are again with an update on the Year 2000 problem, and just for our new members, the first *Millennium File* was published in the June issue this year Vol.10 N°10, and explains quite simply the computer crisis that faces us all in a couple of years time.

You may also be interested to know that the *Millennium Files* appears as a regular monthly article in **FORMAT PC** which gives a more in depth coverage with up to date reports on what's going on around the world as mankind begins to wake up to this looming disaster. So far these articles have proved very popular with the majority of our readers. But I do apologise to all our members who get both magazines as all the contents of this round-up you will have seen before.

The year 2000 problem has been likened to peeling onion: every time you peel off a layer you find another underneath, and every time you find yet another layer, you cry. No one has found the centre yet and nowhere is that better illustrated than with PCs.

Many computer users are not technically minded, and it is difficult to establish what they mean when they ask "Is my PC 2000 compliant"?

There are five elements within a PC that can generate, retrieve, format and manipulate date information in some way. All of these need to be compliant if the PC system as a whole is to be '2000 Ready'.

These five levels are, in ascending order: the CMOS real-time clock chip, the BIOS, the operating system, the software package and the application.

The first three levels are generally where packages and applications get their date information from. Any of the higher levels may get its date information from any lower level, and may correct, reformat, or corrupt the information retrieved from any lower level.

The only real answer is to ensure that real-time clock, BIOS and operating system are all compliant.

The root of this problem is in computer software and microchips that may read the year 2000 as 1900 (or something else). These chips that could be affected are used in products such as security systems, parking lot gates, telephone systems, automatic teller machines, sprinkler systems, video recorders, medical devices and factory machinery.

There were 3.5 billion programmable micro-controllers shipped in 1995 and seven billion last year. No one knows where they all are and no one knows if they are year 2000 compliant or not. These are just the new ones, the bulk of them are years older. Maybe as few as 5% are affected by the date bug, but it's not certain. And, there may not be enough chips around or being made to replace the ones at fault.

Many systems with these embedded chips are in highly inaccessible places, on

communication satellites, undersea cables, buried pipelines, and nuclear reactors.

For example, a micro chip controlling when a bank vault can be opened and closed. It allows the vault to be opened during the working week, but keeps it closed at weekends. For security reasons it has been buried inside the 20 ton door of the vault, and can only be inspected by removing the whole door.

The problem arises because the bank building has been built around the vault, so to inspect or change the microchip requires half the building to be demolished and the door removed. The people who built the chip, vault and the bank never imagined that the chip would have to be removed in the lifetime of the building.

Midnight 31/12/99 the chip has been programmed to read only the last two digits of the year, and assumes the 19 prefix. As the year rolls to 00 it believes it is back in 1900. That would make no difference, except that January 1st, 2000 falls on a Saturday while the same date in 1900 was a Monday. The vault will open on Saturday and Sunday, but not on later working days, so to ensure depositors have access to their deposits, the bank building has to be demolished.

Insurance companies are beginning to issue year 2000 insurance policies. They are designed to cover unforeseen business disruptions that may result when systems are converted to handle the century date change.

There is expected to be a flood of year 2000 lawsuits in the latter part of 1998, when many systems could begin failing. Lawyers all over the world are preparing to make a killing out of the once in a lifetime opportunity.

In a Year 2000 conference in New York

recently it was predicted a post 2000 scenario in which shareholders sue companies, customers sue suppliers and the only winners will be the lawyers!

In one case of legal action, in the USA, a mid western manufacturing company received a shipment of perishable chemicals at its production line that had 01/04/00 expiration date. The company's inventory system rejected the shipment as having expired in 1900, the chemicals were returned, and the production line was shut down for a lack of materials. The chemical suppliers and the manufacturer settled out of court!

It's not only the 1st January, 2000 that will cause havoc either, in fact, a whole range of dates cause a variety of systems to distort data or crash completely.

Ford Motors has uncovered problem dates when fixing its systems, but the 9th September 1999 is raising the most eyebrows. The people working on year 2000 projects discovered the COBOL programmer's habit of using 09/09/99 in a six-figure date field to mark the last record in a file. But, in some cases it was found that 09/09/98 was used to mark the last record in a file where users entered 09/09/99 to mean that the field should be left open all the time!

British Telecom have almost finished checking its 1,700 suppliers to find out whether they will be '2000 Ready' in time. Most of them are ahead on their millennium projects, but BT are keeping tabs on the progress of all of them.

BT manager Mili Lewis (whose title is 'millennium specialist') says that if any one of BT's millions of domestic customers was to say to her: is the telephone service going to work on the 1st of the next century? *[it still surprises us how many people make the mistake of thinking that 2000 is the start of the new*

century. *Ed.*] She would say to them that at this point in time, BT cannot guarantee that that service will be up and running! No amount of money can guarantee certainty for British Telecom or any other large multinational telecom company in the year 2000.

The MOD admitted that some of its systems have already experienced millennium problems, but declined to give details on the grounds of national security. The timetable for government departments has been set for December 1998 to achieve compliance, so that all systems have a year to bed-in so that any problems can be identified.

They are also checking to ensure its 40,000 suppliers will be '2000 Ready', but according to their latest survey only 18% of the 152 contractors who replied had started a compliance programme. They were sponsoring a conference this month entitled 'Millennium Compliance for MOD Suppliers'.

The great roll-over could result in local government bosses being thrown into prison if their systems crash. Council officers could be found grossly negligent if they failed to make their systems compliant. A large number of local authorities have not yet started the task!

At the moment two experts seem to lead the field on the year 2000 subject - their names appearing in print more frequently than any others. Peter de Jager who's company 'de Jager & Company Limited' runs the US based Year 2000 Information Centre in partnership with the 'The Tenagra Corporation' is without doubt the biggest name (although some consider him a bit of a pessimist because of his doom and gloom outlook on the subject). In the UK, Robin Guenier seems to be the most prominent person. He is executive

director of Task Force 2000, an organization which brings together the CSSA (Computer Services and Software Association), the UK government, and the Confederation of British Industry which was formed to accelerate and ease year 2000 repair work.

Task Force 2000 was established by the previous (Conservative) government. However, this bomb is going to explode in the middle of Labour's first term so they're the ones that will face the music.

The Liberal Democrat's technology spokesman, Nigel Jones, has called for action to ensure that PCs are millennium compliant, he wants the sale of non-compliant PCs to be banned. But, if you are thinking of buying a PC, Dixons have guaranteed that any they sell will be made year 2000 compliant outside of its normal warranty commitments.

Many experts claim that users still only have a 50:50 chance of buying a PC that will work without interruption in the next century. Also, year 2000 specialists are calling on the PC industry to initiate a sticker campaign to help users identify which PCs have millennium compliant BIOS chips.

Karl Feilder, founder of a company called Greenwich Mean Time conducted tests at user's sites which included PCs from both big name and smaller manufacturers. In all, the 500 pre-1997 BIOSes looked at revealed a massive 93% were not year 2000 compliant. 79% could not roll over from 1999 to 2000, and 14% did not know the year 2000 was a leap year.

Feilder also says that of more than 4,000 off the shelf PC software products they've looked at, only 28% were claimed by the manufacturer to be compliant. One major supplier of software has just

withdrawn all its happy assurances from its Web site about the year 2000 compliance of its products. It has replaced them with a terse "we are still investigating" message.

I recently came across these year 2000 Deadly Myths, if you believe any of them then you are in deep trouble!

- ♦ *It is a simple technical problem, just expand the field by 2 digits;*
- ♦ *We have plenty of time;*
- ♦ *Our systems will all be replaced by the year 2000;*
- ♦ *We do not have a problem, all of our systems are fairly new;*
- ♦ *Someone will invent an automatic solution;*
- ♦ *We will outsource our entire workload;*

Getting closer to home, the topic has had a full page feature in our local daily newspaper *The Citizen*. Ray Clapton from a local firm says "The 'Millennium Time-bomb' has the making of a phenomenal disaster which could dwarf the nightmare of the Wall Street Crash!" In case that wasn't enough to set my dear old home town trembling, here are some points he published on why Gloucester should worry.....

- ♦ *Fixing the year 2000 problem is the biggest single software project ever encountered;*
- ♦ *The impact is being felt now and will continue to grow as we approach the millennium;*
- ♦ *There is no quick fix solution - every set up is different;*
- ♦ *Some companies have already left it too late;*
- ♦ *Senior management awareness of the problem is generally low;*
- ♦ *One in 10 businesses may already be destined to go bust;*
- ♦ *The cost of fixing year 2000 will rise*

as time shortens;

- ♦ *Staff resources needed to fix the problem will be in short supply;*
- ♦ *The problem will not go away.*

A recent report says that because there is a shortage of skills and experts to cope with the workload this two digit problem is creating, many large companies may even take people off the dole queue to help with the repairing and testing. They would get to learn a computer language, although a good training program may not be a substitute for experience, it may be the only choice available of getting the millennium job done.

Thank you to all of you who have sent in the material I use to make these *Millennium Files*, I read every item with great interest and even if I don't include everything I receive, its probably because it goes straight over my head, but keep sending your clippings, you never know I might learn to understand it one day.

And to end on an amusing note, Peter de Jager, who I mentioned earlier, ran a Year 2000 Limerick contest and here is the winner:-

**In composing a limerick to portray
The problems presented by the Year 2K,
While searching for a rhyme,
I ran out of time.....**

But this one's my favourite:-

**Do you have a millennium plan?
Or are too many worms in that can?
If you think "She'll be right"
Then stay up on the night
And just see your I.T. hit the fan.**

I'll just leave you with this thought though: does 03/02/01 mean March 2nd 1901, 3rd February 2001, or 2003, February 1st? Confused? Well now you know how a computer feels!

MINEFIELD

A step by step guide to writing a C program using SAM C.
Part 2.

By:- John Eyre

To really understand how to program in C, you'll need a good tutorial or reference book. They are usually pretty thick, cost an arm and a leg and are unlikely to make good bedtime reading. Fortunately it's possible to produce quite useful software knowing only the basics of the C programming language.

This series of articles is not intended as a tutorial on the C Language or on how to program, it is a step by step guide to the development of an example game using SAM C. It's written around the standard version of SAM C, not SAM Vision.

Last month we looked at the strategy for our Minefield game and at the pre-processor instructions needed to start things rolling. This month we will start with variables.

External Variables

To keep things simple we will declare variables needing to be accessed by a number of functions as external variables. In C, variables declared within a function can only be directly accessed by that function. Making variables globally available to all functions is not a problem for the small program we are writing, but it is not a recommended practice for large complex software. So we will have a quick look at the use of pointers which can help to overcome this problem.

If you are used to programming with Basic sub-routines, another apparent limitation is that a C function can only

return one value. If our program needed to update more than one variable it would be necessary to call separate functions to get the values. Using pointers allows variables outside the function to be changed. The concept of pointers is one of the reasons why C is such a flexible and powerful language.

External variables are declared outside of any of the functions including main() i.e. they are global. Most of the external variables we will need can be deduced from the high level description we worked up. The variable type e.g. integer (int), character (char) must be indicated. Variables of the same type can be grouped on a line, separated by a comma. Each line should be separated using a semi-colon. While not essential, it is often useful to provide brief descriptions as comments.

```
// Declaration of external variables
```

```
int rows;    // Number of rows in minefield/array
int cols;    // Number of columns in minefield/array
int mines;   // number of mines marked
int cleared; // number of cells cleared
int bang;    // flag set to 1 if you try to clear a mine
int total;   // total number of mines in the minefield
int xx, yy;  // horz & vert co-ords of cursor position
int finished; // flag set to 1 when game over
int map [14][30]; // 2 dimension
```

```

al array representing
// the minefield. The array si
ze must
// be defined and cannot be va
riable so
// the largest size needed is
declared.

```

Just to demonstrate the use of comments the list could equally be written as below. Although some effort is made to use descriptive variable names, it is not overly helpful.

```

int rows, cols, map [14][30], xx
, yy;
int total, mines, cleared, bang,
finished;

```

As we are using rows and cols as variables which define the size of the minefield and hence the array, it would be ideal if the array could be declared as map [rows][cols]. However, one of the main reasons for declaring variables is to reserve space, so the actual size of the array must be defined at the time it is declared. We will define the largest array size we need and when a smaller minefield size is selected, only part of the array will be used. If we had been content to fix the minefield size at the time the code is compiled we could have used symbolic constants. By using variables we will be able to use different minefields selected within the game itself.

Function Definitions

Now all the formalities have been completed and we can begin to write the functions that will make up the game. The definition of a function has the following format:-

```

type function name (type paramet
er1, type parameter2 etc)
{
    type variable names; // declar
ation of variables

```

```

body of function
i.e. executable statements
}

```

The type preceding the function name relates to the result returned by the function. It can be one of the normal types e.g. int, char or if no result is returned then void is used. If no parameters are passed to the function then (void) or just () is used. Note there is no ';' separator at the end of the line, it will cause some odd error reports at compile time if you put one there. The remainder of the function is enclosed within curly braces {}.

Lets begin with main(). It can be large or small but there must be a main() as it is from here that the program will start to run. It is common practice to keep main() small and simple by putting any complexity into other functions. In our case main() will end up looking very similar to the psuedo-code of the high level description we worked up earlier.

Stage 1 Initialization functions

As we will develop the program in stages we will need to modify main() as more functions are added. First we are going to write a function called initialize() to do some initial setting up, so main() should look like this:

```

main ()
{
    initialize ();
}

```

The approach I'll use is to list the function definition and then discuss particular aspects of the code. The Initialize function will call two other functions. One will print instructions the other will print a title banner for the game. The title will also be used for the instructions, so lets look at the function

definition for title () first.

```
void title ()
{
    paper (0);          // make paper
r and border colour black
    border (0);
    cls (0);            // (0) mea
ns clear the complete screen
    paper (14);         // set paper a
nd pen colours
    pen (0);            // for title
banner
    printf ("\a\\*** MINEFIELD **
**"); // print at 0,10
}
```

This is a nice simple function to start with. As the title is required by both the instructions and the game screens, setting the background colour and clearing the screen is done here to avoid writing the same code twice. Note that the parameter 0 passed to the cls() function tells it to clear both top and bottom parts of the screen. The printf () function allows print data to be formatted. The '\a\\' is the equivalent of 'AT 0,10' in SAM Basic.

Lets look now at the function to print instructions.

```
void instructions ()
{
    title ();
    paper (0);
    pen (6);
    printf ("\a\\Instructions:\n\
n");
    puts (" Clear the Minefield an
d mark");
    print (" the mines without hit
ting one.");
    at (7,2);
    print ("Controls:");
    at (9,1);
    puts ("Cursor Keys SPACE=check
Q=Quit");
    print (" M=Mark Mine or Remove
Marker");
}
```

```
pen (15);
at (14,0);
printf ("Select E-Easy M-Medi
um H-Hard");
}
```

The function title () is called to clear the screen and display the title banner. For demonstration purposes three different ways of screen printing are used, printf(), print() and puts(). The most versatile is printf(), which allows formatting of the data to be printed. In this case the print position is set and the \n means newline i.e. move the print position to the start of the next line. Functions print() and puts() can only print strings of characters. The difference between them being that puts() includes a newline after the text has been printed. Since print() and puts() don't allow print formatting the at() function is used to set the print position. I find that I often need to use printf() because print() and puts() don't respond to changes to paper and pen colours unless cls() or printf() has been used.

Both of the above functions instructions() and title() are called by initialize() which is itself called from main() on program start up.

```
void initialize ()
{
    int r, c; // declare variables
local to this function
    char key;

    mode (4); // use screen mode 4
instructions ();

    // Get difficulty level to defin
e size of minefield.

    rows=8; // default size will b
e Easy
    cols=8;

    key=getch ();

    if (key=='m' || key=='M')
```



```

{
    rows=10;           // s
ize for Medium
    cols=20;
}
if (key=='h' || key=='H')
{
    rows=14;           // s
ize for Hard
    cols=30;
}

title ();

// centralize box and window in
top part of the screen

r=rows/2;
c=cols/2;
pen (14);
box (128-c*8-3, 100-r*9-4, col
s*8+5, (rows+1)*9+8);
window (16-c, 15+c, 9-r, 9+r )
;
total = (rows*cols)/6;
}

```

This function is a bit more involved. The variable `key` is assigned the value of the key pressed, obtained by calling the function `getch()`. By using the 'if' construct we can determine which level of difficulty is required and set the size of external variables `rows` and `cols` which determine the size of the minefield array. No check is made for 'E' as Easy will be the default level used when any key other than the M or H keys is pressed. Note the use of 'M' and not "M". This is because C treats characters as strings and appends a zero as a terminator. Using 'M' tells the compiler we are dealing with the single byte character M. Note also the difference between (= assigns) and (== equals).

Apart from the slightly different appearance, 'if' performs just the same as in Basic. The C format is:-

```

if (condition) // e.g. conditio
n being m or M key pressed.
{

```

```

    statements to be processed;
}

```

The functions `box()` and `window()` are included from external libraries as declared at the start of the program. The parameters passed in the parameters list provide co-ordinate, width and height information to place the outline box and the window in the centre of the screen. Graphics co-ordinates are used by `box()` i.e. pixels and character co-ordinates are used for `window()`. To avoid repeated calculation, the variables 'r' and 'c' are assigned the value of half the rows and columns. Note that as well as fixed values and the value indicated by a variable name, a parameter can also be the result of a calculation defined in the parameter list.

Before we compile the code, the function prototypes, as shown below, should be declared at the front part of the source code, (i.e. after the external function prototype declarations). The prototypes look very similar to the first line of the function definitions but note the ';' separator.

```

void initialize ();
void title ();
void instructions ();

```

Now we are ready to use the Compiler, so press Escape to exit the Editor, SAVE the source code then select Compile and DoIt. Providing everything has been typed in correctly there should be no errors. If there is a problem, use the error message(s) inserted in the source code to help find the problem.

When successfully compiled and assembled, select Run and the instructions should be printed. Press a key and a yellow outline box should be displayed, the size of the box depending on the key pressed.



YOUR LETTERS

Dear Editor,

I mentioned in a previous letter that I was writing a **FORMAT** Index as a word processor file, using the 'Find' option on *The Secretary* to locate any relevant keyword, and I have already used it on a number of occasions, this is the dull boring stuff that is ideal for a computer.

The reason I am sending it in is to ask if you think anyone else would be interested in it? It starts with a list of keywords that act as a reminder of the words used in the main body of the text.

Each issue consists of a paragraph, listing article names with a brief description if not obvious, followed by a list of related keywords. In Help page and Short Spot, individual items are separated by a semi colon. The whole thing consists of almost 11,000 words (Volumes 1 and 2 are not included) and the big advantage is that it is so easy to add or change an item.

A number of times in the past you mentioned books that you were going to publish, even going so far as to say that they would be ready "next month". What were they and what happened to them?

I am surprised that the Hilton Personal Filing System has never been reviewed, is this an oversight, or is there some other reason?

Mr L.W.Simpson in Vol.10 N°5 January'97, p25, asks about monitor supply, he must have missed my contribution to the Aug'96 Help Page (Vol.9 N°12) which I mention my Mitsubishi multisync monitor, which gives a truly magnificent display. I bought it second hand, but in 'Excellent,

little used condition', from Display Electronics in London by mail order for £119 + £4.75 for a tilt and swivel base + £15 delivery + VAT, (It makes me mad when companies do that) which comes to £163. Now that may sound like a lot of money but when you consider that the cost of a new multisync monitor seems to start at about £450 it's not bad value, although they do have analogue RGB and composite video monitors for less. Their adverts can be seen each month in 'Everyday Practical Electronics', and other electronics magazines from your local newsagent. One further point to mention is that during the research for my purchase I saw loads of adverts for second hand Philips CM8833 monitors that were being sold with Amiga's, Atari's, Acorn's and BBC B's. Now I know that just because the Phillips works with all these computers and the SAM, it doesn't mean that any monitor that works with these computers will work with the SAM, but it probably will, so check out local small ads in 'Micro Mart' and other computer magazines.

Mr P.J.Williamson in Vol.10 N°5 (January'97 p23) asks about discs not working in different drives, well I have had two problems. I started using my SAM with an external drive interface and an N.E.C. 3½" drive that I originally bought for my Spectrum and Technology Research interface which, as an aside has, I think, been unfairly criticised, at least version 5.1 that I have which has all its DOS routines numbered and can be activated by just calling the right number, and also has a simple Basic syntax. I have only ever written one

machine code routine and it successfully accessed the disc. Back to the disc problems. I have 15 W.H.Smith discs that I used for many years and everything was fine until I put an internal drive interface and PC drive into my SAM. The new drive, and only the new drive would have nothing to do with these 15 discs not even deigning to format them, but all my other discs had no trouble. The second problem arose when I ran out of discs for my SAM and used a disc that had been formatted on my Acorn A3000 and tried to format it in the SAM under MasterDOS...no go. After much rolling on the floor kicking my heels I tried to format the disc under SamDOS...no problem, more heel kicking and calling Dr Andy Wright's parentage into question. Is this a real bug with MasterDOS or more likely have I done something wrong.

Now for a wild thought, some time ago mention was made of the problem of using a hard drive for the Spectrum being that the DOS would take up too much memory. How about using a second Spectrum as a dedicated drive controller and networking the two Spectrums? A possible problem that I can see is that the data transfer rate of the network might be too slow. If it did work then it would have a soft ROM even if it is only for the H-DOS!

I enclose a SAM disc with my **FORMAT** index and a copy of this letter to save some time in case you decide to print any of it.

Finally, as you now seem to control the construction of SAM computers would you be able to supply me with ten disc drive mounting screws which I believe are N^o4 x 40 UNC x 3/16".

Yours sincerely, Ken Murray-Taylor.

Quite a lot there Ken, Jenny was pleased that you put such a long letter on disc as it saves her a lot of hassle.

First, your index, I'm quite sure there

will be lots of **FORMAT** readers interested in it even though at the moment only SAM users will be able to read it. Why not do a small ad for it and offer it to readers for a small fee.

The problem with books (and with some other things) is that the idea seems very good at the time, but people out there in Spectrum and SAM land do not seem prepared to put pen to paper and simply say "Yes please, we would be interested". The result is that other (more pressing) items take over and some projects sadly just get shelved.

So let me take the opportunity to ask readers - What do you want to see? Write and tell us and you may have a chance of seeing it produced. This applies to books, articles, software and hardware. If you don't write we can't help.

I hope readers find your comments on monitors useful, and those on discs. And no, there isn't a bug in MasterDOS although it is more sensitive in some ways to discs. I've never had quite the problem you describe but it is almost certainly down to the discs already having some format information on them, MasterDOS as you will know tries to read the disc before formatting so that it can display the 'Format disc "name" Y or N' message. I can only surmise that the system is getting confused by strange information.

The idea for a hard drive for the Spectrum is not as far fetched as some may think - I know someone who used a 286 PC with a 120Mb hard drive as a file-server to his Spectrum. Things were a bit slow as he used a serial link at 9600 baud via an Interface One, but it was a working system.

Ten drive screws? Funny quantity. There are actually M3 6mm panel head bolts, Maplin part number JY21X and costing about 20 pence for a packet of ten. However, I'll get Jenny to put some in with your **FORMAT** as you saved her a lot of typing. *Ed.*

Dear Editor,

In case some readers might be tempted to buy one of the budget priced Cannon BJC-240 colour printers now on sale at Curry's or Argos stores, to use with the SAM computer to produce colour graphic prints or letter heads, I would like to raise a note of caution.

I purchased this model to use with a PC with Windows installed and, for this purpose, it produces good results in monochrome and in colour. However, I thought I would investigate whether it could be made to work with any of the SAM utilities and sent for the Programmer's Manual to see what control codes had to be used to print in colour. To my dismay, there was no reference to printing in colour anywhere in the Manual. After several phone calls to different offices it transpired that this information is commercially confidential as the colour printing software is under licence from another party and is distributed in the form of a colour software development kit only to commercial software houses!

I don't know how many bubble jet printers are subject to the same restriction but, if you are thinking of buying one, and wish to use it for colour printing with any system other than Microsoft Windows, it will be worth speaking to the manufacturer's technical office to see whether the necessary control codes can be made available to private programmers.

Having said that, if you only require a cheap bubble jet to print in monochrome with SAM, then the BJC-240 is very good value.

Yours sincerely, Ray Bray.

Thanks for the words of warning Ray. It is a problem that is becoming more evident each year. *Ed.*

Dear Editor,

Please can anyone help me, I've corrupted my SAMTAPE 4 disc and have

just discovered that LERM who wrote the program no longer exist! Would anyone be able to supply me with a copy of this?

Yours sincerely, Walter Lloyd.

Anyone help Walter, if so then could you please just pop a little note in the post to him c/o **FORMAT** so we can pass the message on to him. *Ed.*

Dear Editor,

One of my main programming interests using the SAM computer has been the use of SAM's MIDI output port. I have programs which enable me to encode musical scores and the computer will play my keyboard much better than I can hope to achieve.

At first my programs were limited for music data storage to the unexpanded 64K of RAM. However, from knowledge picked up from **FORMAT** magazine experts I then managed to make use of SAM's memory paging system and now I have almost the whole of the 512K RAM in which to store data. This means I can store musical works which take up to 30 minutes or so of playing time.

One aspect of MIDI however continues to baffle me. I have tried to develop a program that would allow me to play the keyboard and by using the MIDI IN port, allow me to store the music data into RAM in real time.

I have used Basic and Machine code programs to continually sample the MIDI IN port but I never seem to get anything that means MIDI data is being transmitted.

I am wondering whether any readers or possibly your 'in house' experts can help. Has anybody any information on this subject? I know the data bits I should get, the problem is just finding them.

Yours sincerely, Peter Williamson.

I was under the impression that when a byte of data was formed in the

MIDI-IN port an interrupt was generated. Beyond that, is beyond me, I'm sorry to say. Can anyone help Peter? **Ed.**

Dear Editor,

I live in Preston, Lancs and have been looking around for someone to repair my PLUS D but have had no luck. Would you, or any of your readers, be able to put me in touch with someone who could fix it, where ever it might be.

Yours sincerely, Norman Fryer.

Sorry Norman, but at the moment I can't help. The usual problem is the failure of the PAL chip (the custom programmed logic chip). There was someone looking at programming a new batch earlier this year but I have not heard anything since. **Ed.**

Dear Editor,

I look forward to the rest of John Eyre's 'Minefield', a SAM C program from **FORMAT** Vol.11 N°2, but I hope there won't be so much redundancy as in Part 1.

There is no need to include names of library functions, such as 'extern void box (int x, int y, int w, int h);' among the preprocessor instructions: the inclusion of the appropriate library, in this case 'graphics.h', is enough. Then your program, under 'main()' can include statements such as 'box(20,30,40,10);'.

The compiler checks that the names of all functions in main () appear in the libraries specified or among the functions that your program defines; if all is well, the code is copied into the object program.

Yours sincerely, Ettrick Thomson.

Thanks for the letter Ettrick. While I am far from being an expert in C it would appear that you are right as far as SAM C is concerned. However, I'm told that it is 'good practice' to include these lines anyway as it helps to document the

program and allows you to see at the start what outside routines are used. **Ed.**

Dear Editor,

I was very pleased to visit the Gloucester show in October. You and the **FORMAT** team did a very good job again.

Talking to Rev. Tony Kinch out in the back room was very rewarding as he really opened my eyes to some of the things that *The Secretary* can do. Please encourage him to write more for **FORMAT** - he certainly knows his stuff.

Yours sincerely, Bill Riteman.

Glad you liked the show Bill. Yes, I agree, with Carol Brooksbank on one side of the room and Tony Kinch on the other there was certainly a lot to interest people in the back room - well done to both of them. **Ed.**

Letters may be shortened or edited to fit on these pages although we try to edit as little as possible.

This is YOUR letters page so it is up to you to fill it with interesting things. Come on, get writing, any subject even remotely related to computers. Just keep things as short as you can so we can fit in as many as possible each month. Please write clearly or type your letters. Send them to the address on page 3 or fax them to us on 01452 380890.

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PLUS D

TRANSFORMER PROBLEMS

By:- Ben Curren.

Ever since I purchased my PLUS D back in October 1992, when I tried to format a disc the interface would chatter away merrily to the drive for a while and then cut out. Datel were, rather predictably unhelpful when I rang their 'technical helpline'.

Wondering what had happened, I tried, unsuccessfully, to get control back. The only way to achieve this was to reset the +2, but then the disc drive would not respond to the PLUS D at all, I just got a 'CHECK DISC IN DRIVE' message. To get the drive back, I had to unplug the drive and then plug it in again. The disc seemed to work OK, so I left it at that, just formatting discs one or two at a time as I needed them, disconnecting the drive from the mains after each disc.

However, after having used up several discs recently, and thus requiring some more to be formatted, I decided that I would have to do something about the problem. I remembered reading about a problem similar to this in an old issue of *FORMAT*, Vol.7 N°3, Nov 1993, when Kevin Gould concluded there was a transformer problem.

After learning this, I felt the temperature of the transformer after attempting a *FORMAT* command, and nearly burnt myself. By taking the cover off the drive, I could carefully put the voltmeter probes on the power supply connections, which, when the drive was in standby, read 5V. However, when a *FORMAT* was started, this voltage

dropped to about 4.4 volts, and then when the drive cut out, to 3.8V.

My next line of investigation was to take the power supply transformer to pieces.

CAUTION: *Live electrical parts are exposed when the cover of the transformer is removed. If in doubt consult a qualified electrician.*

Inside, I found the cause of all the heat, a 5V regulator chip. The power supply was really quite simple, a transformer (converts mains AC to lower voltage) a bridge rectifier (converts AC to DC) a capacitor (to smooth the supply) and a 5V regulator chip (provides exactly 5.00V from anything between 7.5V and 38V) - without a heatsink.

Now, these regulator chips do get hot while they are running, and they are usually mounted on a heatsink to cool them down, but if they do happen to get too hot they have a thermal safety cut-out feature which, believe it or not, shuts the device down. The regulator, although getting very hot when a lot of current was drawn by the drive during a *FORMAT* and then cutting out, didn't otherwise seem to be faulty.

By holding the pliers on the heatsink mounting plate on the chip (to act as a heatsink) while formatting a disc, the voltage stayed at 5V and the *FORMAT* was completed successfully. This would point to putting a heatsink on the chip, but just to make sure, I did three more successful *FORMAT*s with the pliers in

place to make sure.

I happened to have some heatsinks from old regulator circuits, so I bolted one of these onto the chip, and bent it into a suitable shape so it would fit into the power supply case. Although you could use any piece of metal, especially aluminium for the job - just bend it so that it has a large surface area and will fit in the case.

On re-assembling the unit, **FORMAT's** could now be carried out successfully, and the voltage output from the transformer did not drop as low as it did previously: indicating that the regulator chip was much happier.

While the cover was off, I also noticed that the terminal connected to the **MAINS** side of the transformer had broken away from the terminal in the plug, which was causing sparking inside the unit. To repair this I had to unsolder the two mains terminals going into the transformer, remove the transformer and the circuitry, and re-solder the wires to the back of the terminals which go into the wall. Do not try and remove the transformer without unsoldering these mains wires, as something will break.

Note that when any metal object is bolted to the regulator chip, it is then at zero volts, and thus should be insulated from any other metal objects in the unit. This is perhaps best done using insulating tape either on the heatsink, or on any metal objects it may touch, such as the transformer itself. Don't get the tape near the chip itself though, as this gets very hot when operating, and may melt the tape.

Editor's Note: This article refers to the Datel version of the PLUS D which had a disc drive powered by a separate transformer.

Writing for **FORMAT**

FORMAT recently celebrated its 10th birthday - a real landmark for any magazine. In that time an incredible amount has been written and published about our two favourite machines - the SAM and the Spectrum. You may think there is nothing more to be said or done - but you would be **WRONG**.

There is lots more to be said and done, but only with your help. We need your contributions. Letters, items for Short Spot, questions for the Help Page, articles - both large and small, reviews, news (*we always need more of that*).

There are so many ways in which each of you can help us to keep **FORMAT** going well into the new millennium - but we do need your help, **NOW!**

You don't have to be a brilliant writer to contribute, you just need something to say - and every one of you out there has something to say. It is our job to edit your contribution into shape for **FORMAT** - and that is a job we love to do. So come on, get writing, even the smallest items is better than nothing.

How about that little program you typed in and got working from one of the old glossies? Provided you mention the original mag and author we would love to see it.

Please, do your bit to help, you can't expect others to contribute if you don't. Honest, it doesn't hurt, and you will have the pleasure of seeing your work in print (extra copies of **FORMAT** to pass on to relatives are available at special discount prices <grin>).

Ring us if you need help or ideas.

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